Integrity Service Excellence

GCSS-AF Overview

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(MITRE FFRDC)

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Purpose

Provide a general overview of GCSS-AF including an operational support architecture perspective

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GCSS-AF Vision

GCSS-AF Vision: Provide accurate, timely, trusted information to the Warfighter

- **Focus on improving Air Force Mission**
- **Consolidate, Integrate, and Operate Central Information Technology Services and Capabilities**

- **Enterprise Benefits**
  - **Increased Operational Readiness**
  - **Decreased Decision Cycle**
  - **Reduced $/Flying Hour**
  - **…**

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Why GCSS-AF?

- **Kosovo Lessons Learned**
  - **Legacy systems were not designed for Expeditionary Operations**

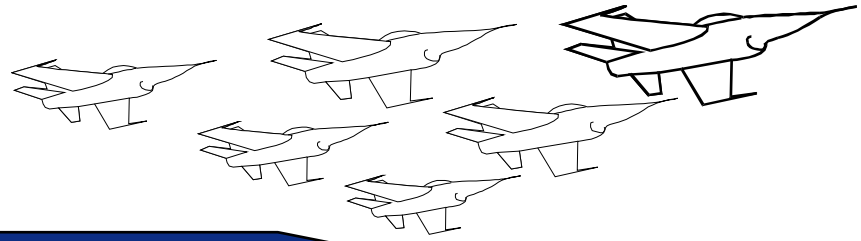
Couldn't accurately match munitions to mission requirements

Couldn't match trained personnel to mission needs

Couldn't deploy legacy maintenance system - safety of flight maintenance (TCTO) status is unknown

No single application has all the required information – We must have the capability to pull cross-functional information

Business Areas Supported by GCSS-AF



Operational Support

- Acquisition
- Chaplain
- Civil Engineering
- Communications
- Comptroller
- Contracting
- Health Services
- Legal
- Logistics Plans
- Maintenance
- Materiel Management
- Munitions
- OSI
- Personnel
- Public Affairs
- Quality and Manpower
- Safety
- Security Forces
- Services
- Space Support Teams
- Supply
- Transportation

640+ Systems

250+ Locations Worldwide

>20,000 concurrent Warfighters on-line

300,000+ Warfighters/Users Worldwide

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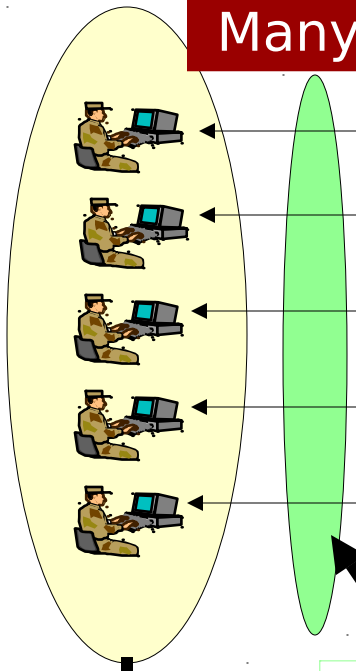
What is GCSS-AF?

From
Many to Many--Stovepipes



Logistics Data Bases

Security Data Bases

Medical Data Bases

Manpower Data Bases

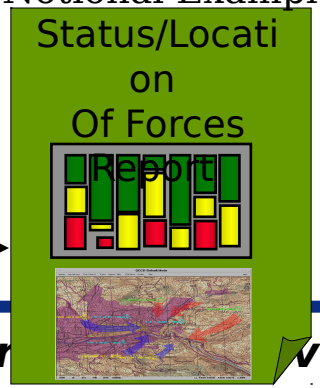
Personnel Data Bases

Various Methods Of Connection

Manual Combining Of Stovepipe Info

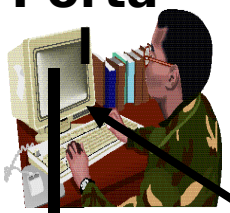
Days to Weeks To Generate

Notional Example



To
One to Many: Integrated

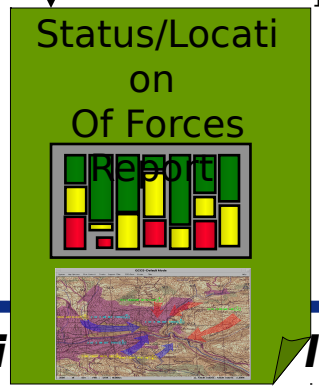
AF Portal



NIPRNET
SIPRNET

Near-Real/Real-Time Generation At Any Terminal Using Only a Web Browser

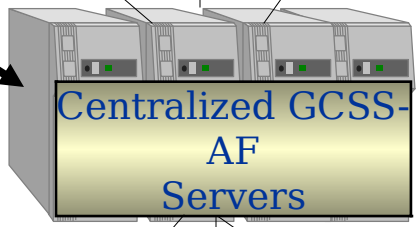
Notional Example

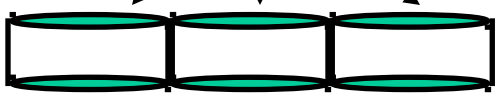


Log DBs

Fin DBs

Per DBs



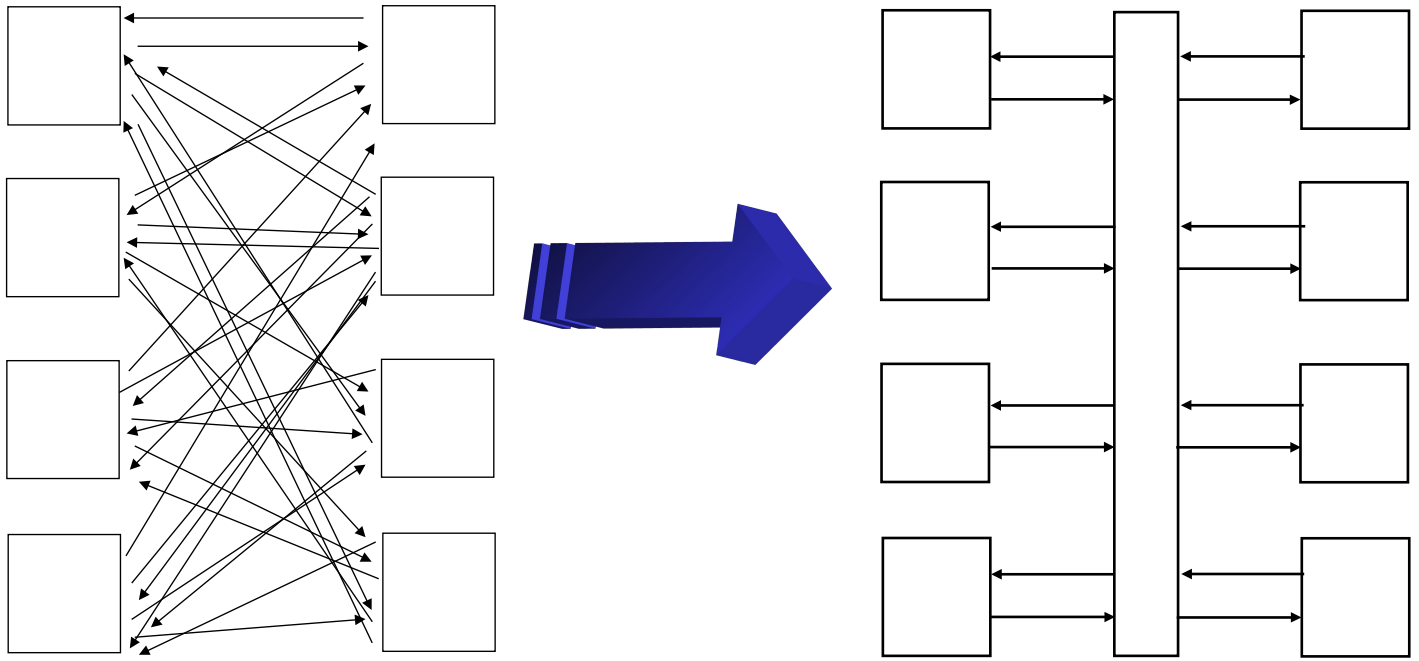


Enterprise Data Warehouse

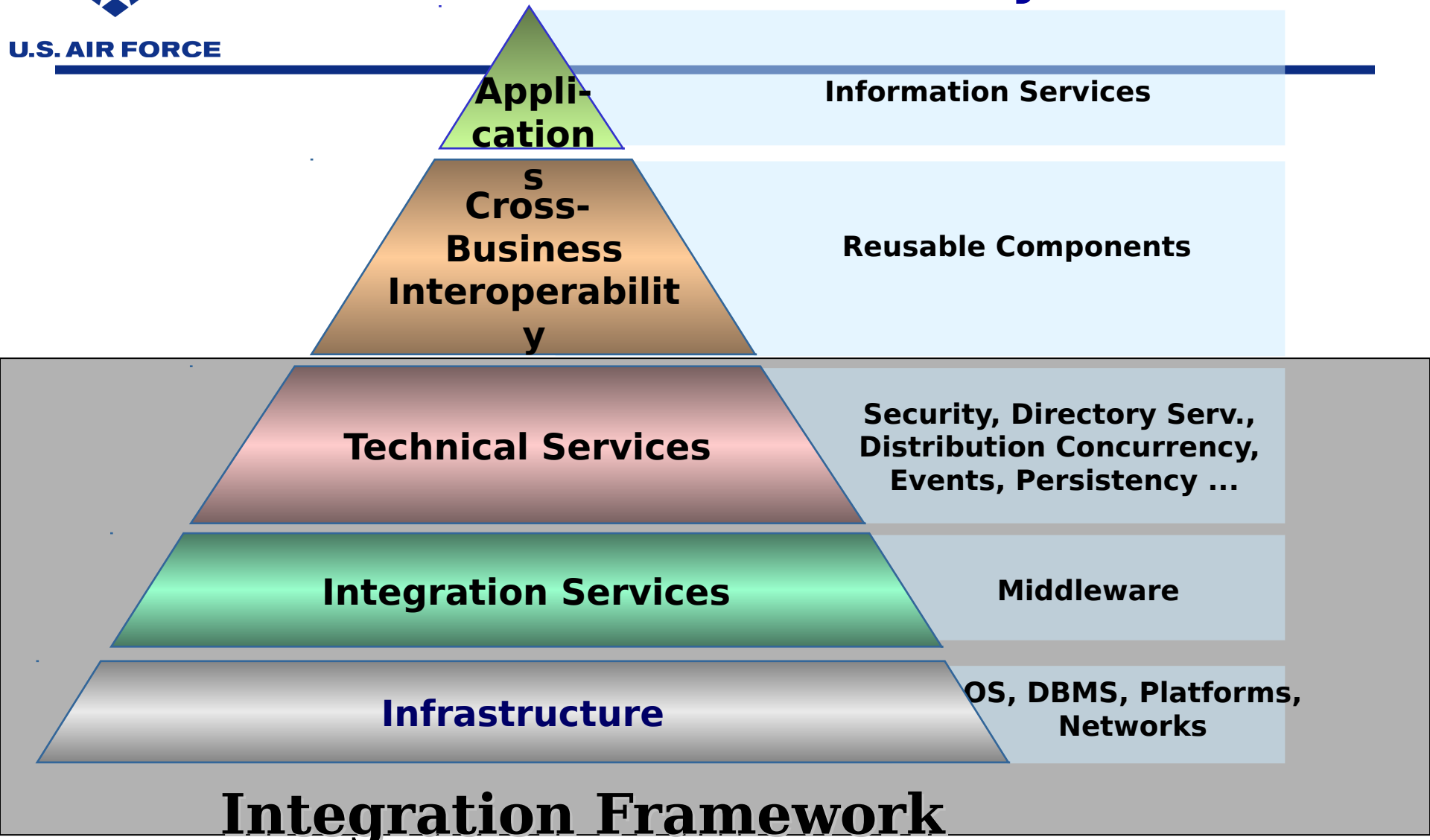
Integr vi llence

A Case for EAI / Web Services – End The Tyranny of Point to Point Interfaces

From <many to many> to <many to one>



GCSS-AF Framework Layers



GCSS-AF Framework Layers

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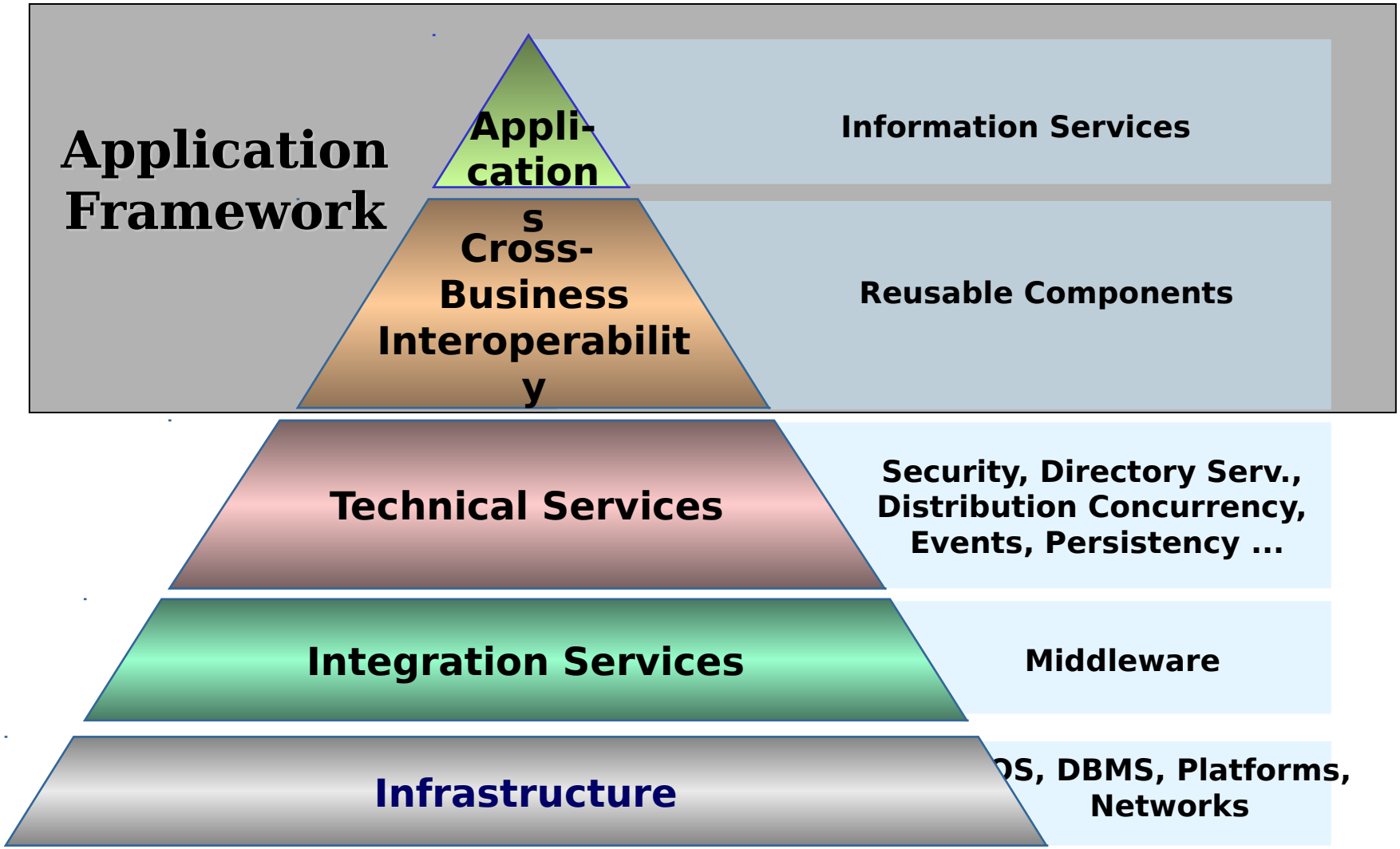

GCSS-AF Today

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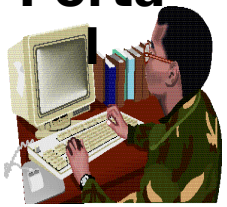
AF Porta



NIPRNET
SIPRNET

DISA Montgomery DISA Dayton

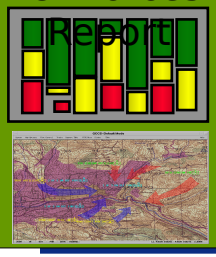
Enterprise Security (IBM's Access Manager)

Enterprise Services: End-to-End Measurement, .COM Access, PKE, EAI, MOM, Edge Services, AD/AM Int

Near-Real/Real-Time Generation At Any Terminal Using Only a Web Browser

Notional Example

Status/Location Of Forces Report



Application / Transactional Databases

Centralized Application Servers

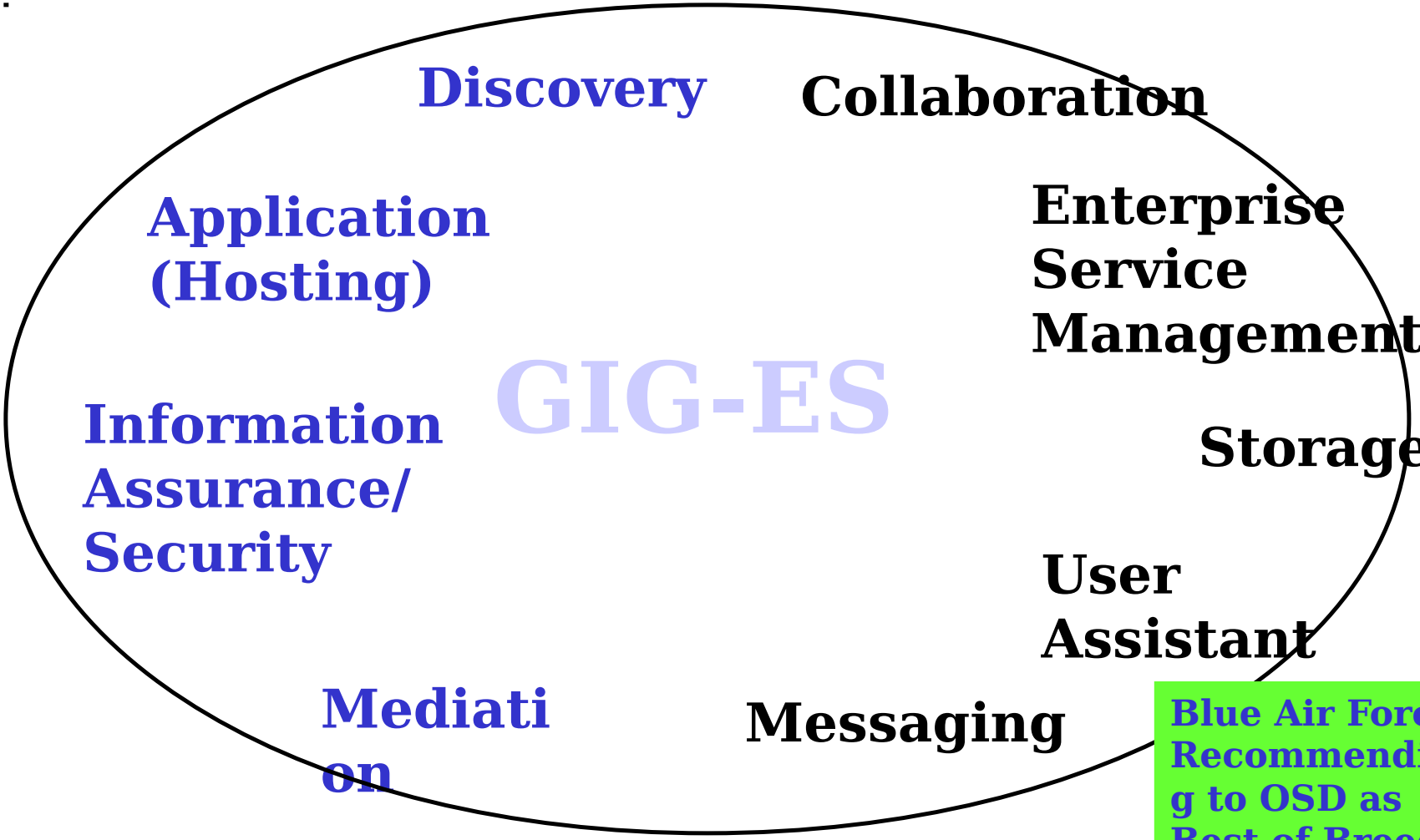
IBM Oracle Microsoft (J2EE, IIS)

Centralized Application Servers

AF Portal (Broadvision)
Instant Messaging (Bantu)
Search (Verity, Autonomy)
Reduced Sign-On
AF Publishing CMS
EIM
Functional Applications

AF Knowledge Services (NCR's Teradata)

GCSS-AF Enterprise Services Architecture



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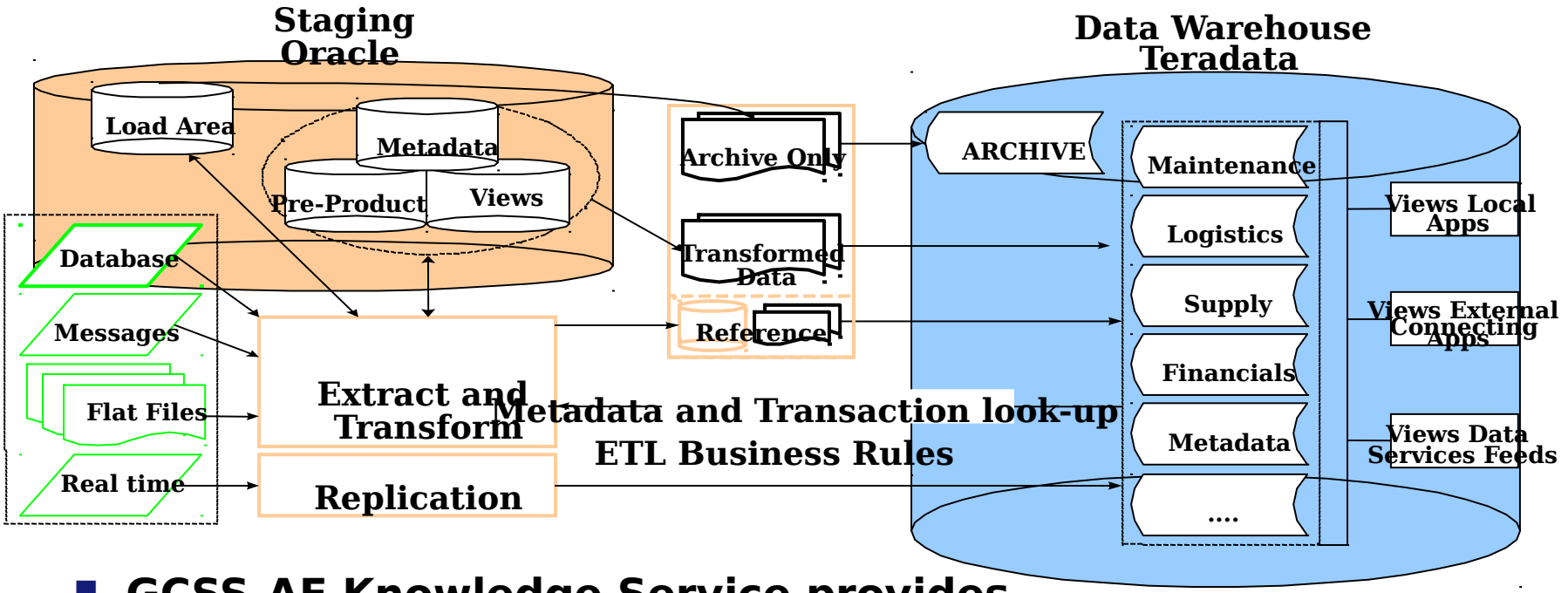
GCSS-AF Knowledge Service (EDW)



- GCSS-AF Knowledge Service provides
  - Enterprise data store for current state and history
  - Interface consolidation for periodic data flows
  - Data aggregation and fusion into information for analysis
  - Data mining for trends and predictive needs analysis
  - Database and data mart consolidation

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Mission Benefits of GCSS-AF

- Commander can disseminate information real-time to all authorized users in command
- Every airmen has the full IT power of the Air Force in his hand (browser device) to execute his mission
- New capabilities deploy immediately worldwide
- Leverages the capabilities of today's web aware airmen
- Hierarchical architecture allows mission focus of all implementers
- Integration across disciplines to Commander's view

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Fiscal Benefits GCSS-AF

- Consolidation – Massive Scale Efficiencies
  - Web Servers
  - Storage
    - Data Warehouse and Data Marts
    - Databases
    - SANS
  - Processing
    - Better load balancing Air Force resources
    - Computing on demand via Commercial lease (I.e. edge servers)
  - Support staff
- Security - solve once for everyone
- Architecture - solve each piece once
  - Exploit on NIPRNET and SIPRNET for all IT capabilities
- Enterprise Licenses

GCSS-AF Application Lifecycle

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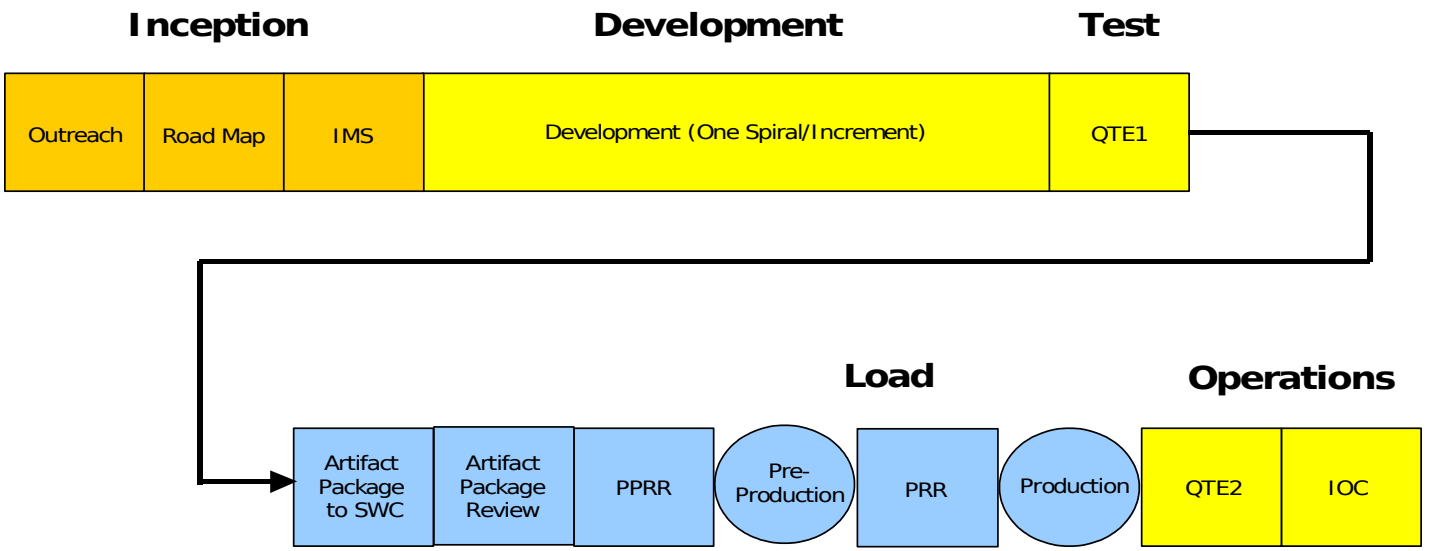
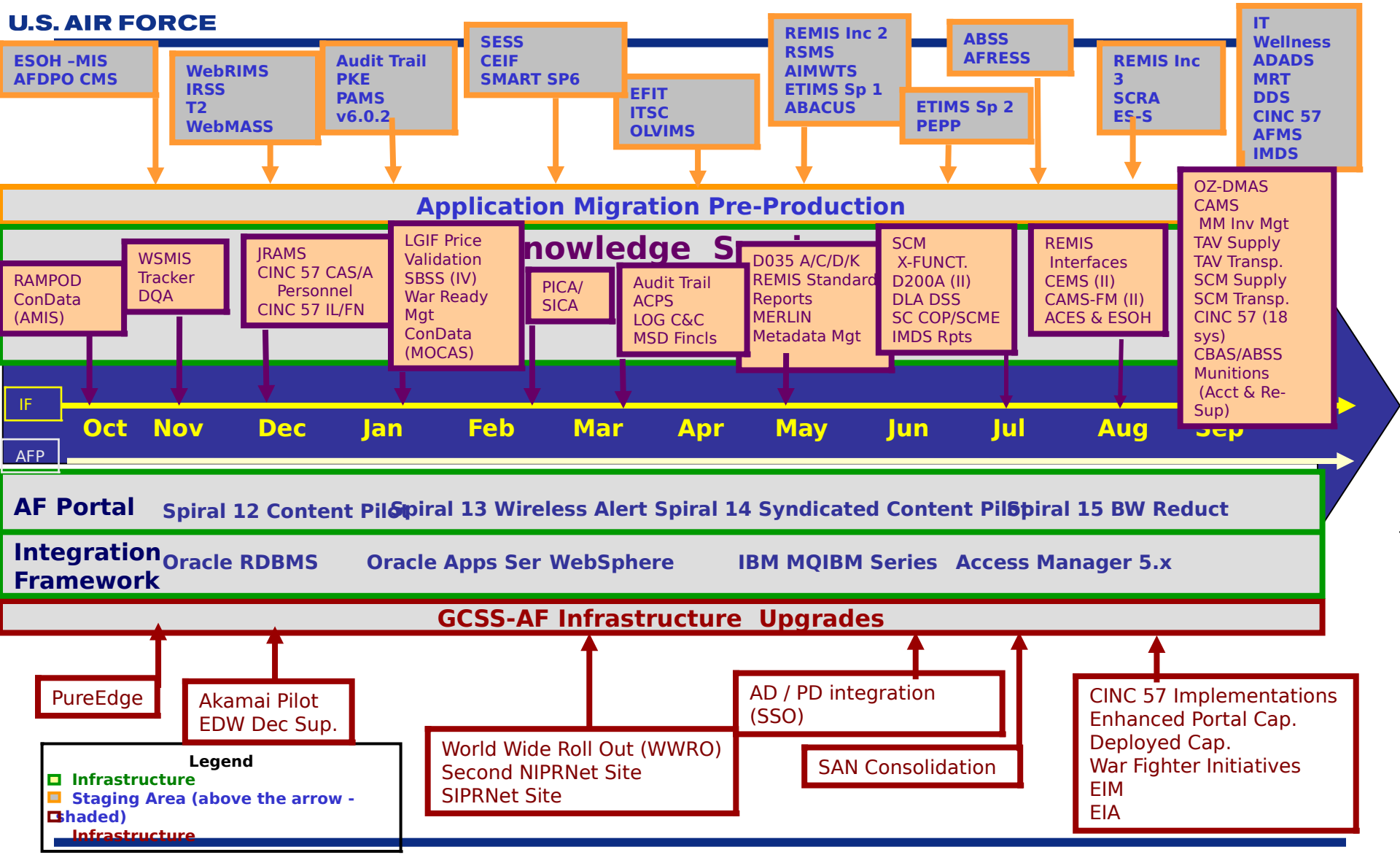
GCSS-AF Lifecycle Process for Applications and Portlets



Notes:
1. At any point recycles may occur that will move an application or portlet back to the appropriate preceding step.
2. Every system artifact (code, instructions, etc) is required to have the latest copy in the GCSS-AF CM library before progressing. This applies to ALL installations to include IF services. All resolved recycles are required to be in the G CSS-AF CM library before proceeding to the next step.
3. All artifacts reviewed and software installed must be retrieved from the GCSS-AF CM library.

FY04 GCSS-AF Roadmap



CONTINUING

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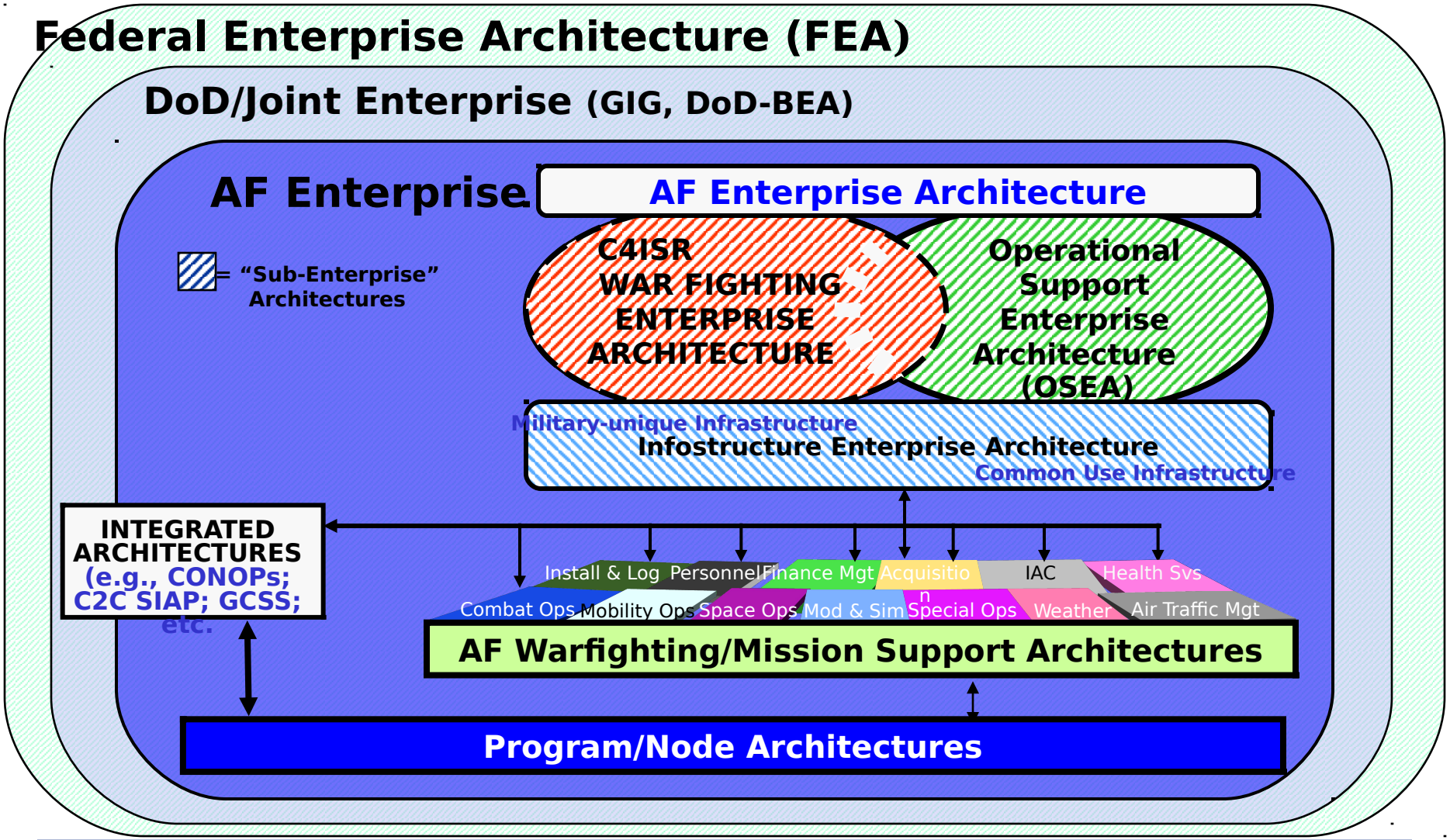
Air Force Enterprise Architecture



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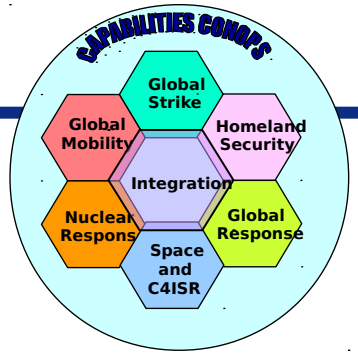
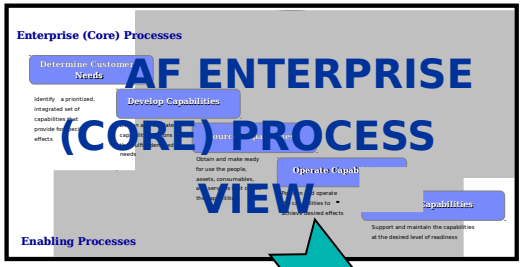
AF-OSEA Development



Capabilities CONOPS

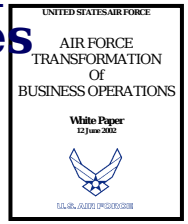
DoD BEA

Business Domain Architectures



AF ENTERPRISE (CORE) PROCESS VIEW

Commercial Architectures



usiness Transformation White Paper

AF TFP

- ✓AF Combat Support (Core Process Al
- ✓AF Business Enabling Support
- ✓AF Governing Support

Acquisition

Airfield Management

Air Traffic Control

Chaplain

Civil Engineer

Combat Plans

Communications/Information

Contracting

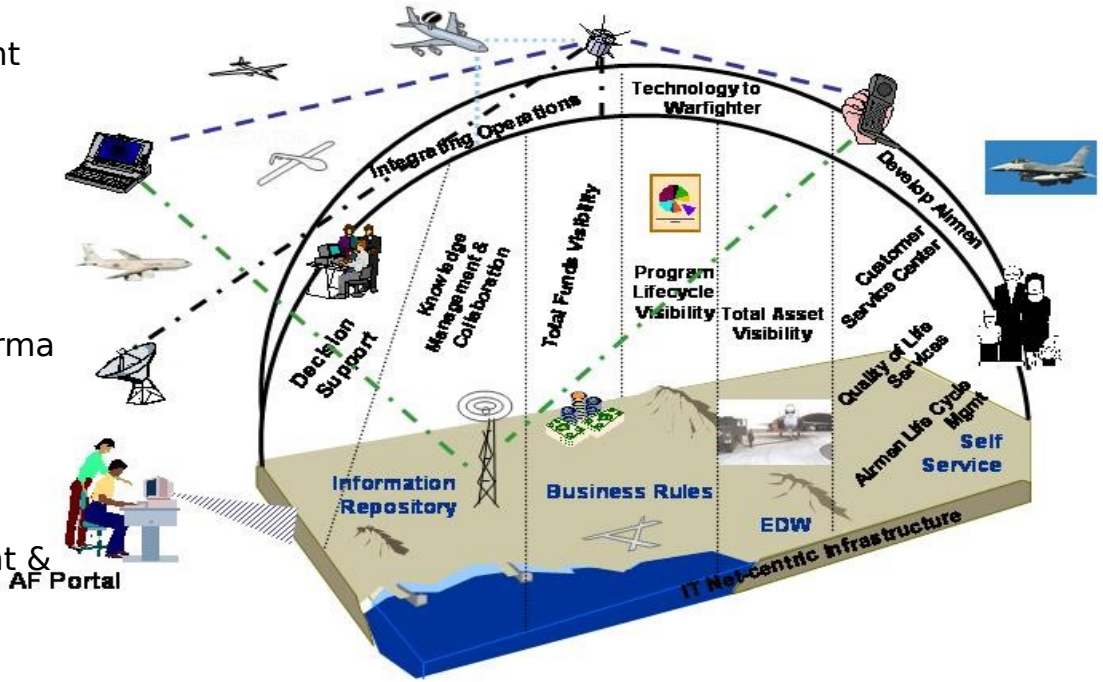
Distribution

Financial Management & Comptroller

Historian

Judge Adv

Office of Special Investigations



Maintenance

Manpower

Materiel Management

Medical Services

Munitions

Personnel

Postal Service

Protocol

Public Affairs

Safety

Science & Technology

Security Forces

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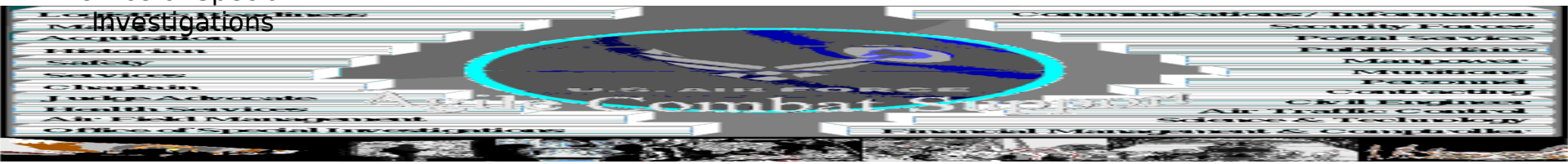
Integrated Operational Support for Combat Ops



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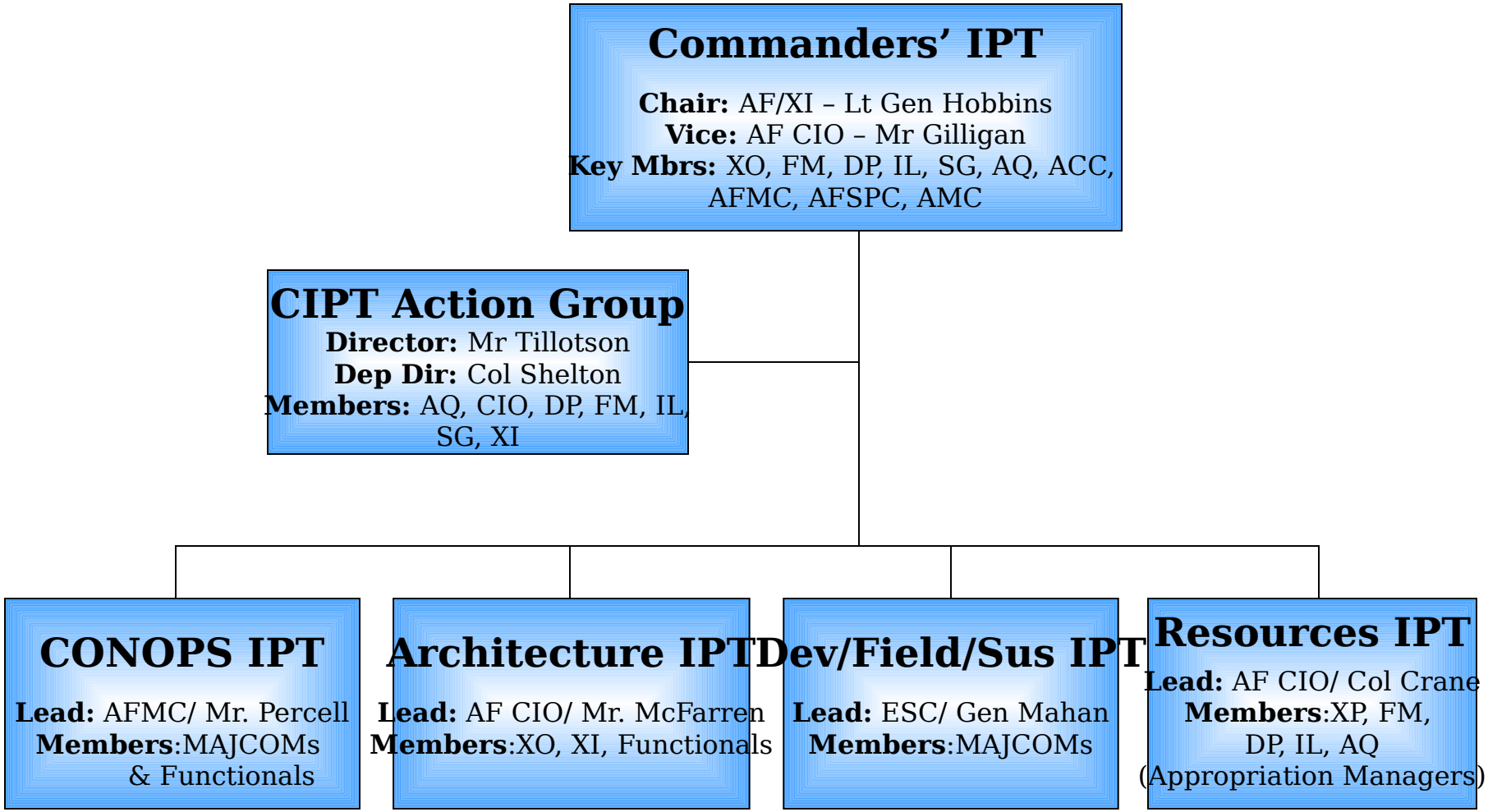
Organizational Structure



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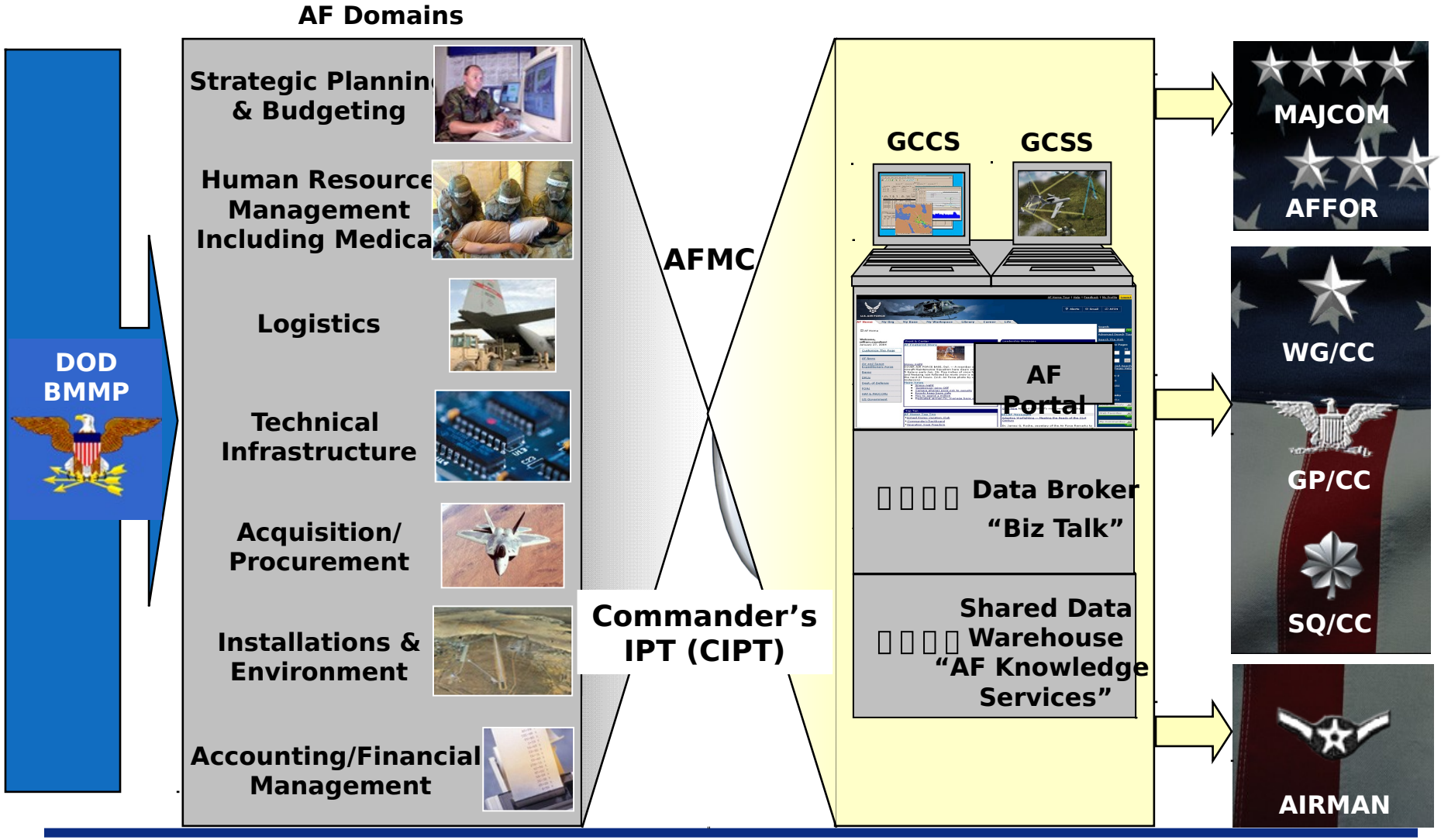
AF OPERATIONAL SUPPORT MODERNIZATION PROGRAM



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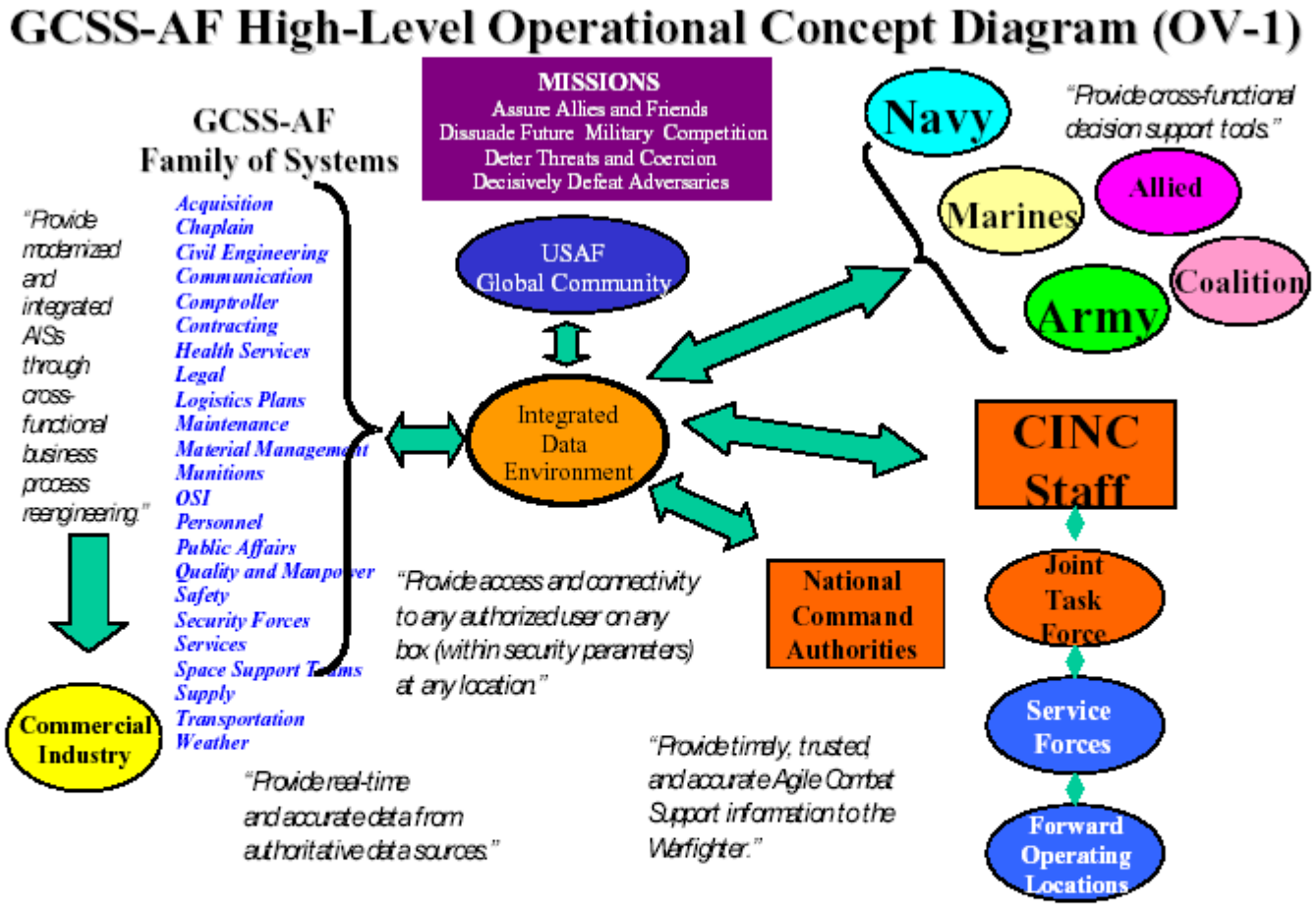
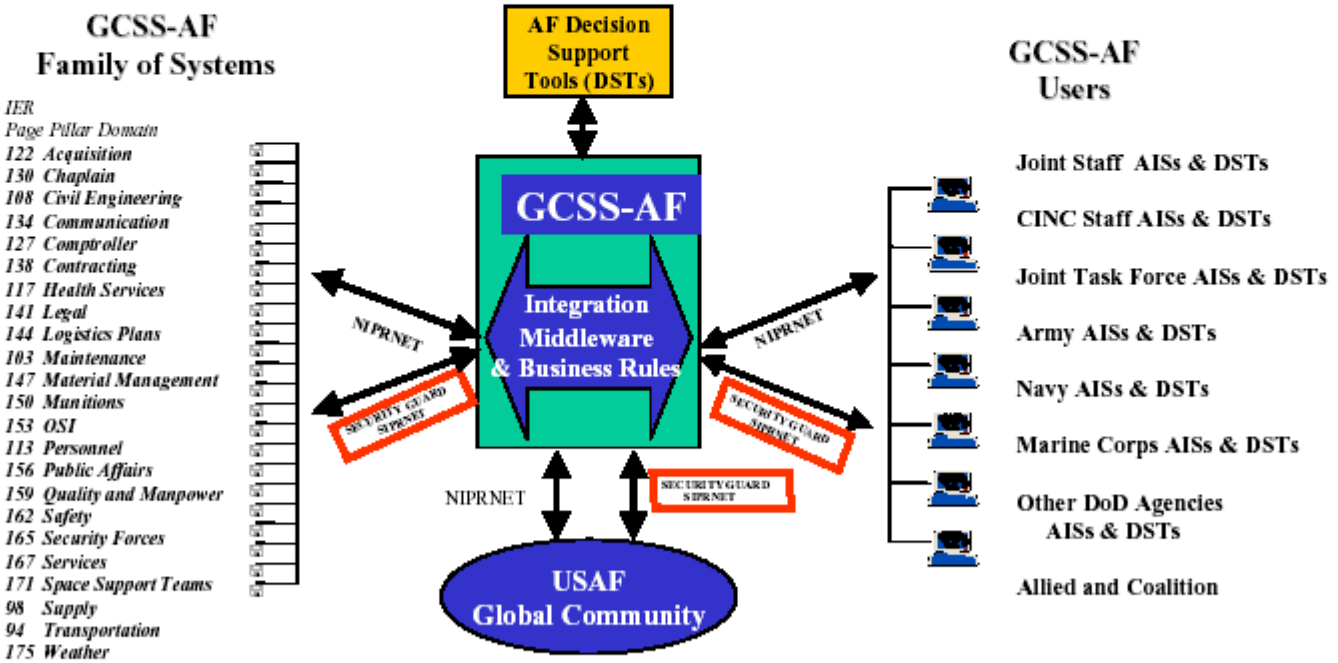
GCSS-AF OV-1 From ORD



GCSS-AF SV-1 From ORD

GCSS-AF FAMILY OF SYSTEMS INTERFACES (SV-1)



GCSS-AF Technical Architecture Profile (TV-1)

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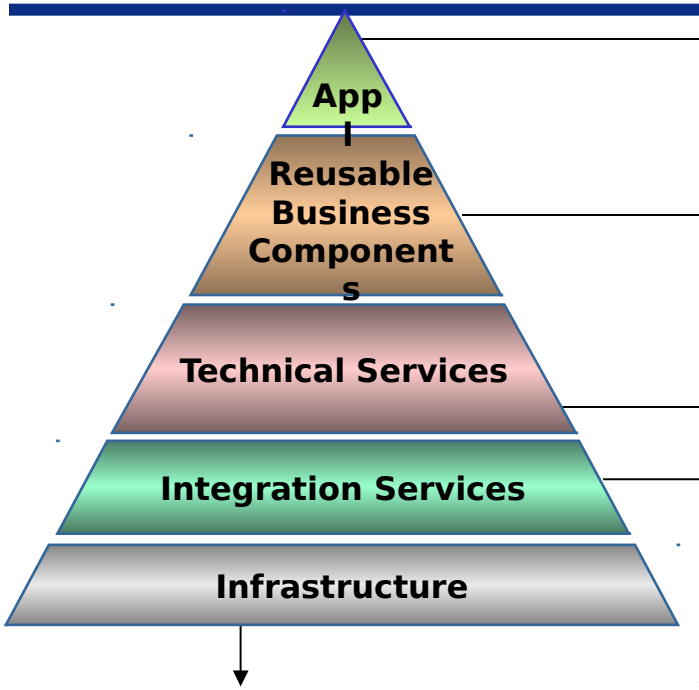

Capabilities
Assembled Components

Canonical Model
OAGI
HR-XML
DoD(USMTF) XML
ERP
CSM

Services
J2EE
.NET
JSP
ASP
HTML
Kerberos
WSFL
WS-I Security

Infrastructure
OS
JVM
DBMS
Networking
Platforms

Middleware
JMS
WS-I Transport
SOAP
ebXML
MOM
XML

Technical Architecture Profile

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Take Aways

- GCSS-AF provides the IT mechanism for improving warfighter and operational support
  - Infrastructure is now focusing on open discovery, management, optimization, and evolution of existing services/capabilities
  - Another focus is on automating mission capabilities across Air Force
  - Current push for AF Portal registration/use and domain/community use of the AFKS
- AF operational architectures are essential to enable GCSS-AF to continue on its transformational path to provide a user with the right information, at the right time, at the right place, and in the right format

BACKUPS

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GCSS-AF “Experts”

Lt Col Joe Besselman
GCSS-AF Program Director
DSN 478-7507

John S. Wunder
GCSS-AF Architect (Lockheed)
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607-751-6096

Mike Riley
AFKS Program Manager
DSN 674-2522

Warfighter and Operational Support Systems

Need Integration on SIPRNET and NIPRNET

Logistics
Personnel
Financial
Medical
AQ

Operational Support Systems

Anywhere Anytime Access

AF Portal

(Common Infrastructure)

Integrated
Data Storage

Enterprise
Information
Mgt

COCOMS & JCS

Warfighter Systems

- Data Integration
- Single Sign-On
- Collaboration
- Decision Support
- Capability Analysis
- Total Asset Visibility

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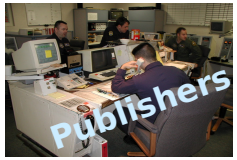
Summary of GCSS-AF Capabilities

- **Availability: 99.7 percent – about 1 hour of scheduled and unscheduled downtime every 10.5 days**
- **End-to-end Performance:**
  - **> 90 percent of transactions in less than 5 secs**
  - **> 80 percent of transactions in less than 3 secs**
  - **> 70 percent of application transactions in less than 2 secs**
- **Users: Average 100K logins/week, approx 40% unique**
- **Content Demand: 600K to > 1.5M pages per day**
- **Applications: > 20**
- **Single Sign On Applications: > 50**
- **Supply Chain Operational Requirements (SCOR) support for critical portions of Supply, Material Management, Comptroller, Contracting, Personnel, Maintenance, Communications, Transportation via the Storage/Knowledge Service**

GCSS-AF IF Services

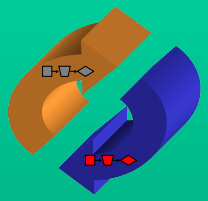
User Community



Service Management
Service planning, consulting, change management, service reporting

Security Single-Sign-On, PKI, Delegated Admin, RSO, RBA

Presentation
Portal Technologies, Profiles, Personalization, Instant Messaging

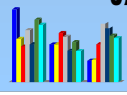


Mission Business Logic
J2EE and MS-ASP Application Servers
Message-Oriented Middleware,
Enterprise Application Integration
Workflow Management

Persistent Data Management
Enterprise Data Warehouse
Virtualized data services

Distributed Computing Support
Intelligent Edge Servers, Compression, Surge Capacity, .com access

Production Engineering
Product integration, performance eng., staging, testing, Performance Monitoring



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Open Standards Support

Data Standards
- ANSI SQL
- JDBC
- OMG Persistent State Service (PSS)
- OMG Persistent Object Service (POS)
- OAG OAGIS
- EJB Entity Beans (CMP)

Messaging Standards
- OAG OAGIS (BSR/BOD)
- OAG OAMAS (AMI)
- JMS
- XML (formatting)

Design Patterns
- Model-View-Controller

Componentization Standards
- J2EE
- EJB

Presentation Standards
- Java Servlets
- Java Server Pages (JSP)
- HTML/DHTML/HTTP

Development Processes
- Rational Unified Process using UML

Security
- JAAS
- PKI (certificates for authentication)
- HTTPS/SSL (data encryption)
- LDAP

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Information Assurance and Security Status

- **Components**
  - **Authentication and Authorization (Access Manager)**
  - **User and Resource Directories (Active Directory)**
  - **Public Key Infrastructure (DoD, Access Manager)**
  - **Network Access Points (Cisco Content Services Switch , Bluecoat, Akamai, AppCelera)**
  - **Identity Management**
  - **Multi Level Security Guards**

Blue Products Selected

Black products current or future focus

- **Benefits GCSS-AF Security**
  - Secure Access
  - Distributed Administration
  - Centralized Control
  - Consolidation efficiencies
- **Standards**
  - Java Authorization and Authentication Standard (JAAS)
  - Kerberos
  - Web Services - Security
  - DoD Public Key Infrastructure (PKI)
  - Security Access Mark-up Language
  - Lightweight Directory Access Protocol

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User Assistant Status

- **Components**
  - Portal (BroadVision)
  - Knowledge Discovery (Autonomy, Verity)
  - Browser (Internet Explorer, Netscape)
  - Information Fusion (Numerous Business Intelligence Tools)
- **Benefits GCSS-AF User Assistant**
  - Common User Interface
  - User customization and personalization
- **Standards**
  - XML
  - HTML
  - HTTP
  - DOM
  - URI/URL

Blue Products Selected

Black products current or future focus

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Collaboration Status

- Components
  - Communities of Interest (Broadvision)
  - Instant Messaging (Bantu)
  - Business Process Scripting and Execution
- Benefits GCSS-AF Collaboration
  - Force multiplier
  - Virtual teaming
  - Operational Architecture Implementation
- Standards
  - WorkFow Management Coalition (WFMC)
  - Web Services - Business Process Execution Language (WS-BPEL)
  - Business Process Modeling Language (BPML)
  - OAGIS
  - DoD Discovery Metadata Standard (DDMS)

Blue Products Selected

Black products current or future focus

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Application Status

- **Components**
  - Application Server (WebSphere, Oracle AS, IIS/ASP)
  - Operating System (Solaris, Windows, HP UX)
  - WebServer (Apache IIS)
  - RAD Framework (Cold Fusion)
  - Edge Networking Akamai
  - Disaster Recovery Failover

- **Benefits GCSS-AF Application**
  - Availability
  - Reliability
  - Reduced Lifecycle Cost
  - Transactional Integrity
- **Standards**
  - J2EE
  - Microsoft Framework
  - POSIX
  - HTTP
  - HTML
  - XA/Open

Blue Products Selected

Black products current or future focus

Messaging Status

- **Components**
  - Application centric messaging (WebSphere MQ)
  - E-Mail

- **Benefits GCSS-AF Messaging**
  - Structured Information Flow across the Enterprise
  - Flexible user information exchange
  - Guaranteed Delivery
  - Publish and Subscribe
- **Standards**
  - Open Applications Group Interface Specification (OAGIS)
  - Java Messaging Service (JMS)
  - Web Service - Transport
  - ebXML - Transport

Blue Products Selected

Black products current or future focus

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Mediation Status

- **Components**
  - Extract, Transform, Load (Informatica)
  - Enterprise Application Integration (BizTalk)
  - Business Intelligence (Business Objects, COGNOS, Oracle Discoverer, Oracle Reports, Brio)
  - Alerts (BroadVision, Autonomy)

- **Benefits GCSS-AF Mediation**
  - Common Information Model
  - Exposure of Enterprise Information
  - Reuse of Enterprise Business Logic
- **Standards**
  - Open Applications Group Interface Specification (OAGIS)
  - United States Message Text Format (USMTF)
  - ebXML Core Components
  - DoD Discovery Metadata Standard (DDMS)
  - ebXML Registry Standard
  - Universal Description Discovery and Integration (UDDI)
  - Web Service - Business Process Execution Language

Blue Products Selected

Black products current or future focus

Discovery Status

- **Components**
  - Catalog, Registry, Repository (GoXML)
  - Directory (Active Directory)
  - Search (Autonomy)
  - Content Management System
  - Data Management Model

- **Benefits GCSS-AF Discovery**
  - Portfolio Management
  - Discovery of Information and Processes
  - Operational Architecture Implementation
- **Standards**
  - Open Applications Group Interface Specification (OAGIS)
  - DoD Discovery Metadata Standard (DDMS)
  - ebXML Registry Standard
  - Universal Description, Discovery, and Integration (UDDI)
  - Web Service - Business Process Execution Language (WS-BPEL)
  - Structured Query Language (SQL)
  - Lightweight Directory Access Protocol (LDAP)

Blue Products Selected

Black products current or future focus

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Storage Status

- **Components**
  - Online Transaction Processing Database (Oracle, SQLServer)
  - Data Warehouse (Teradata)
  - Storage Area Network (EMC, Hitachi)
  - Data replication, caching, and mirroring for multi-site

- **Benefits GCSS-AF Storage**
  - Structured and Unstructured Information Persistence within the Enterprise
  - Optimized performance of data stores
- **Standards**
  - SQL
  - POSIX
  - ODBC
  - JDBC
  - URI/URL

Blue Products Selected

Black products current or future focus

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ESM Status

- **Components**
  - **End to End Performance (AppScope)**
  - **Data Center Performance (TeamQuest)**
  - **Logging (Log4J)**
  - **Storage Management (Oracle, Teradata, EMC)**
  - **Network Management (Tivoli)**
  - **User Management (Tivoli Web Portal Manager)**
  - **WS-Management**
  - **Messaging Management**
  - **Provisioning**

Blue Products Selected

Black products current or future focus

- **Benefits GCSS-AF ESM**
  - Proactive Operations and Support
  - Statistical Process Control
  - Reduced lifecycle cost
- **Standards**
  - Simple Network management Protocol (SNMP)
  - WS-Management
  - Services Provisioning Markup Language (SPML)

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Goals of the GCSS-AF Knowledge Services (AFKS)

1. **Provide central, relatable, trusted, and current analytical data repository for Combat Support and the Business Areas to:**
   a) **Improve decision making capabilities at all levels of the AF**
   b) **Support the Commander in Chief 129 Information Requirements**
2. **Improve Data Management practices:**
   a) **Reduce the data footprint of transaction systems**
   b) **Reduce analytical database thereby eliminate redundant data exchanges**
   c) **Support forecasting and planning engines**
3. **Provide data access services to Communities of Interest**

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AFKS Implementation Goals

- **The goals set by the AF, End-users, and IT community require that data integration activities accomplish the following:**
  - **Cross-Functional Analysis Capabilities (e.g., Finance and Supply)**
  - **Domain Level Analysis Capabilities (e.g., Asset Management)**
  - **Process Level Analysis Capabilities (e.g., Base Supply)**
  - **Support Infrastructure Consolidation (e.g., Reporting for AISs, Tool Databases, and Interfaces)**
  - **Support Process Transformation**
    - Data Quality Analysis
    - Process Auditing
    - Information Flow Auditing
    - CFO Archive
    - ERP Transition

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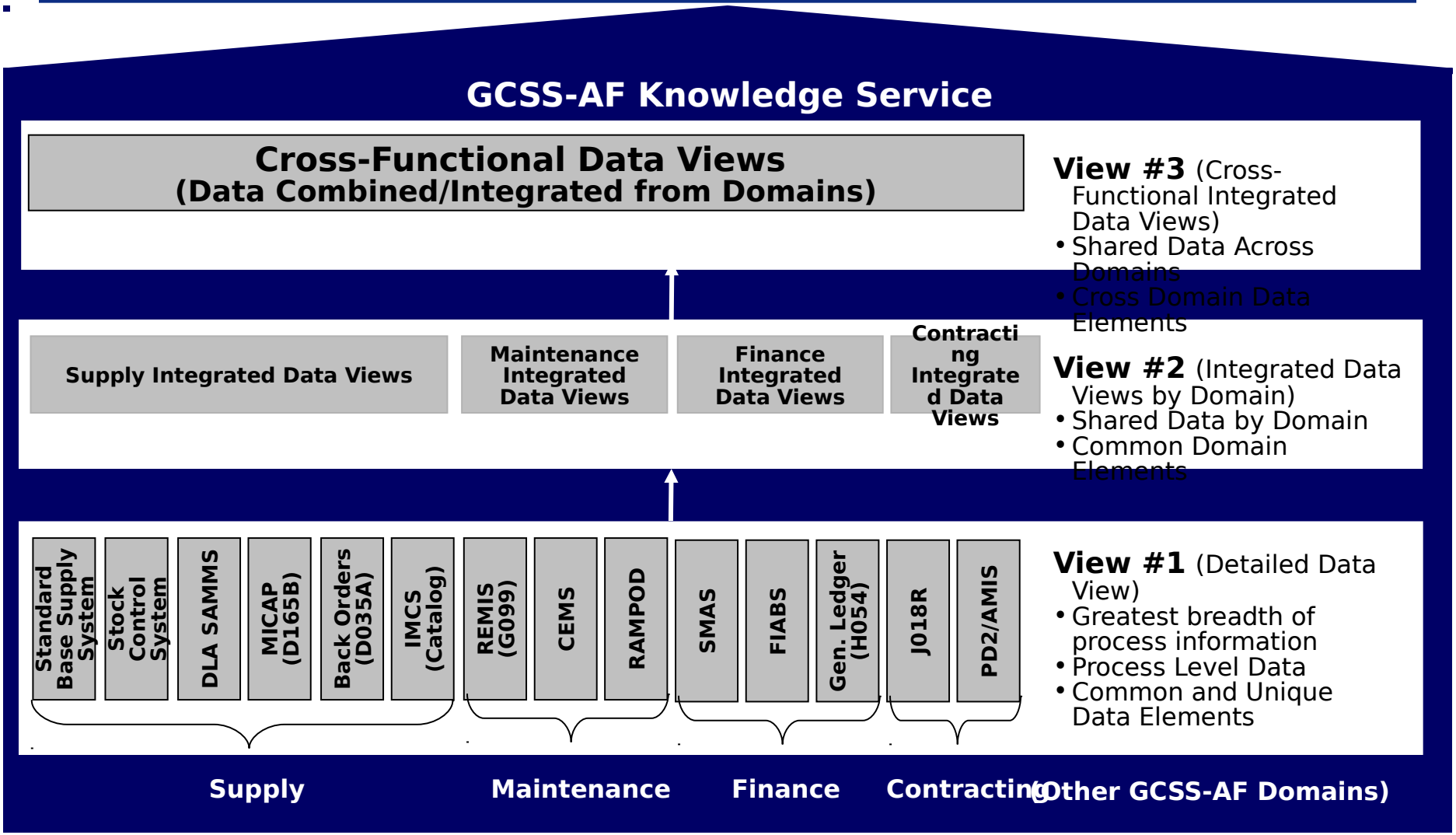
Fulfilling AFKS Requirements

Data Integration and Information Presentation



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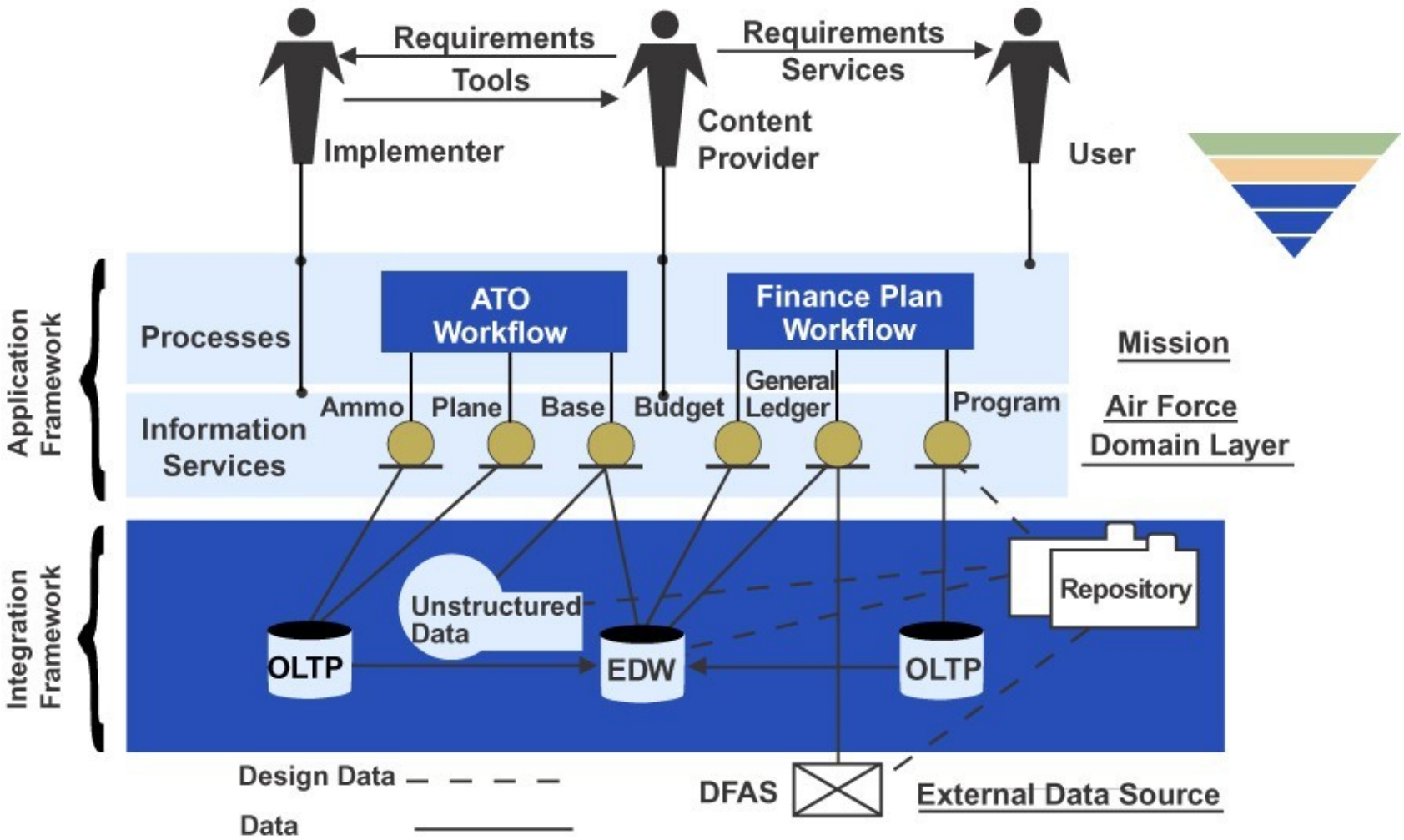
Fulfilling AFKS Requirements

A Core Component GCSS-AF Integration Framework



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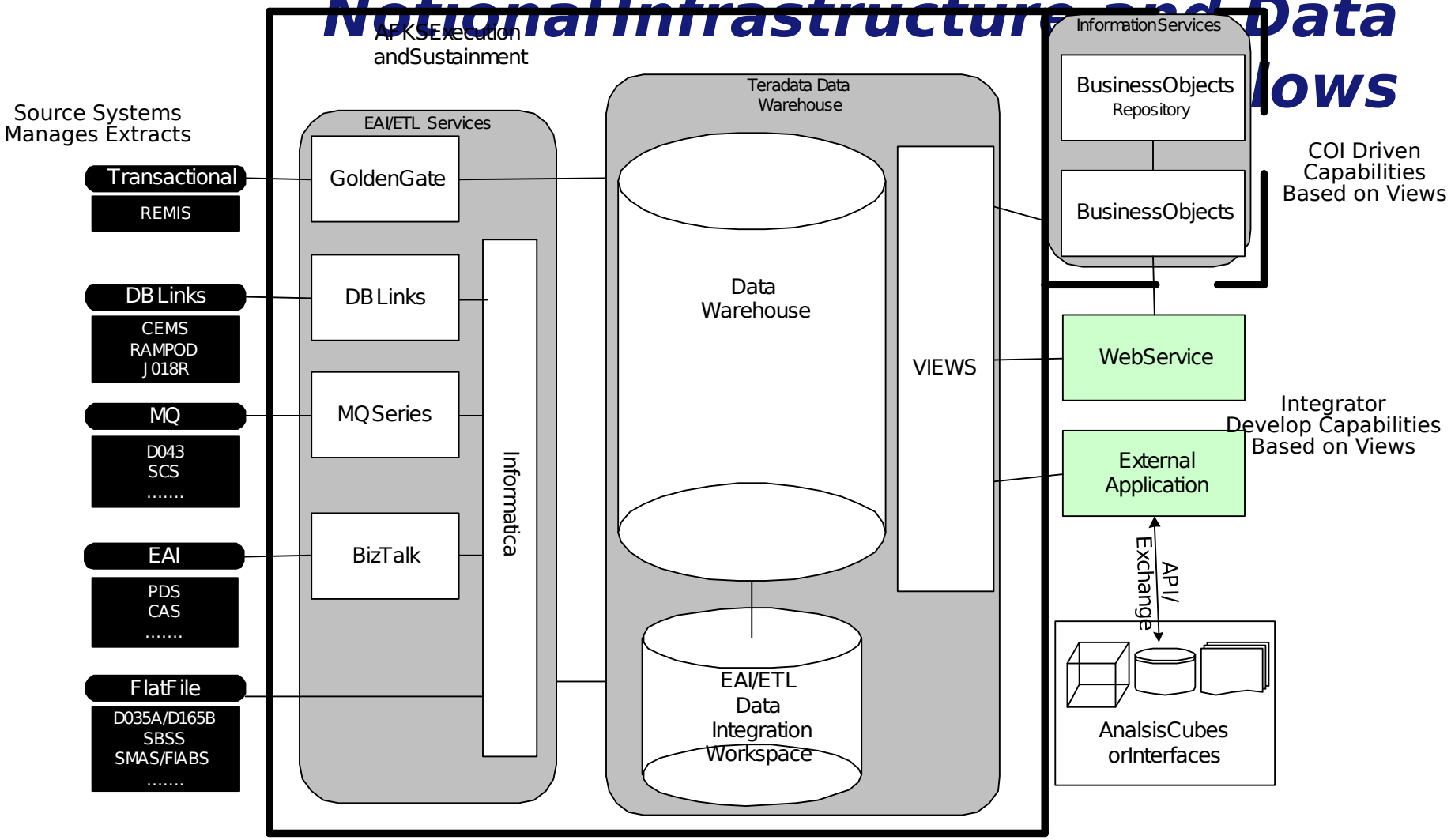
GCSS-AF Knowledge Services

National Infrastructure and Data Flows



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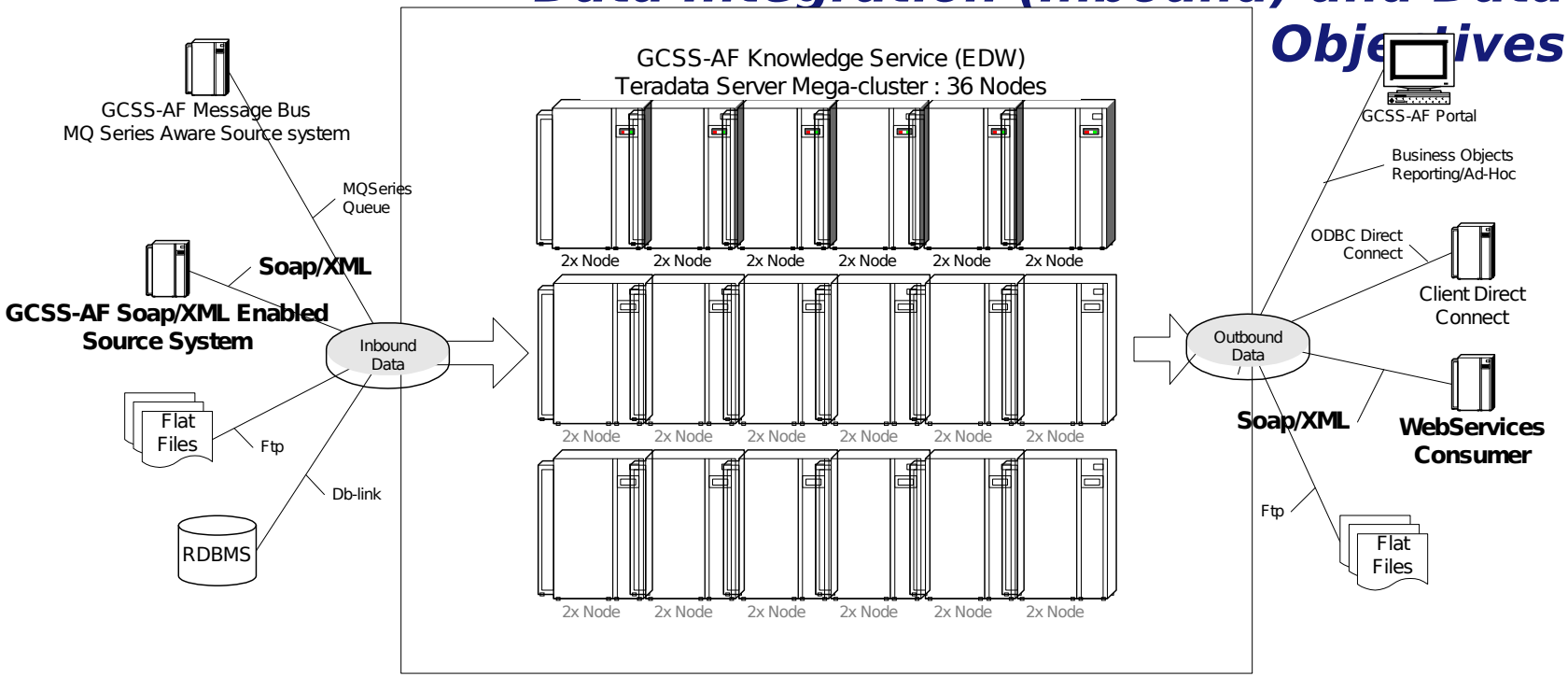
GCSS-AF Knowledge Services

Data Integration (Inbound) and Data Objectives



GCSS-AF Inbound

- Minimizing latency, but accommodating source systems wherever they are in their modernization
- Flat-file, Message Bus, Database links, and Web-services (BizTalk)

GCSS-AF Outbound

- Emphasizing low-cost access through a variety of mechanisms to integrated enterprise data
- Business Objects BI, ODBC/views, and web-services
- Moving toward 'self-service' data integration through web-services